

## Mitigation Measures

Mitigation measures are classified into three broad categories; policy measures, composite investment measures, and standalone project measures. Each category and specific measures are explained below.

Mitigation measures are organized by the type of improvement, with similar types of mitigation measures appearing near together. The order and grouping of the measures is not reflective of how they may be applied.

## Policy Measures

Policy measures are not tied to a definitive capital expenditure, but rather require the development and implementation of new policy by the City. Policy measures are important steps that may be required to meet The City Plan's target of 50% transit and active mode share at two million people. It is not recommended that the Policy measures be implemented immediately, and not all policy measures will necessarily be employed. Instead, these measures will be considered and applied thoughtfully and strategically over time as administration brings forward recommendations to council to support the implementation of the city plan. Policy Measures are presented in Table 1.

**Table 1 - Policy Measures**

Measure	Details
Road Pricing	A longer term potential measure that will require discussion with the City's Legal Services Branch about the ability to pursue under the <i>Municipal Government Act</i> , as well as policy regarding which corridors or areas of the City road pricing should be applied.
Reduced Parking Supply / Parking Pricing	Will require discussion with lot owners/operators in key areas, along with potential policy direction regarding reducing supply (above and beyond the work which has already been completed on minimum parking requirements for developments).
Designated Truck Routes	Designating missing pieces in the truck route network and consideration of removing designations for routes.

### Composite Investment Measures

These include improvements that could be implemented as part of a composite funding program (such as signalization, missing sidewalk links, or geometric improvements). These funding programs support localized improvements at various locations city wide. Many interventions within these composite programs allow for solutions that address multiple issues. For example, safety improvements may be considered and constructed when opportunities are available in all types of projects, not only those projects that are specifically selected and funded to support safety. Composite investment measures are presented in Table 2.

**Table 2 - Composite Investment Measures**

Measure	Details
Transit Measures	
Intersection Based Transit Priority Measures (TPM)	Small scale TPMs, such as signal priority, queue jumps, and bus stop relocations. At locations as identified in the Transit Priority Measures study.
Frequent or Modified Transit Service	Will require coordination with ETS as it may have operating budget impacts. At locations as identified in ongoing Mass Transit Planning work.
Upgraded Intersection Control	Upgrades to existing intersection controls (i.e half signal to full signal, bus actuated half signal installations) to improve operations and safety.
Park and Ride Lots	Location and construction of new park and ride facilities (and expansion / upgrades to existing facilities) to increase transit mode split. At locations as identified in the Park and Ride Guidelines.
Upgrading Mass Transit Routes to Exclusive Right of Way (ROW)	New routes in dedicated ROW, construction of bus-only routes / connections (including bus only flyovers), construction of dedicated protected bus only lanes and conversion of existing roads to transit only operations.
Intelligent Transportation System and Signal Control Measures	
Metered Freeway Ramps	Installation of signals on freeway on-ramps, as well as coordination of signals at the ramp terminal intersections.

Adaptive Signal Control	Installation of new signal control infrastructure.
Corridor Signal Coordination	Retiming of signals along a corridor to coordinate “green waves” for traffic in peak hours.
Lane Configuration Measures	Changes in lane configuration.
Pedestrian/Cyclist Signal Changes	Potential pedestrian scramble locations, installations of new pedestrian signals, and upgrades to existing signals to include bike detection / bike buttons.
Lane Control Measures	
High Occupancy Vehicle (HOV) Lane	Conversion of existing lanes / shoulders to HOV permanently or during peak hours (does not include construction of widening for new HOV lanes)
Peak/Off-Peak Parking Lanes	Converting existing parking lanes during peak hours, as well as opportunities for adding new off-peak parking lanes to slow traffic.
Reversible Commuter Lanes	Installation of necessary infrastructure as well as associated changes at intersections to accommodate reversible lanes. May include removal of existing medians to create space for reversible lanes.
Reversible Turning Lanes	Construction of three lanes in a median that are designated for left turns based on the peak – for example, two left turn lanes in one direction and a single left turn in the other, reversing as necessary during peak and/or off-peak hours.
Adaptable Lane Controls	Variable LED lane designation signage that allows lane designations to change during peak hours (for example a through lane becomes a shared through/left or dedicated left turn lane).
Convert to One-Way	Conversion of roadways to one-way operation to provide more capacity for motor vehicles and/or more space for alternative modes (i.e., wider sidewalks, bike lanes). This may also include examining couplet systems.
Safety Improvements	

Safety Improvements	Small scale safety improvements at specific locations – including changes to right turn geometry (i.e., simple radii), left turn geometry (i.e., slotted lefts), signal phasing (i.e. no turn on red), and pedestrian crossing distances (i.e. bulb-outs or narrower lanes).
Access/Movement Control Measures	
Peak Hour Movement Removal	Banning certain motor vehicle traffic movements during peak hours to reduce congestion and improve flow. For example, banning left turns in/out of a commercial development during the AM peak when demand is low to eliminate signal phases.
Permanent Movement Removal	Permanently banning certain motor vehicle traffic movements to reduce congestion and improve flow. Consideration will need to be given to the accompanying concentration of traffic at adjacent intersections.
Permanent Access Closure	Close existing accesses or intersections where they result in operational or safety issues and where traffic can be accommodated at adjacent intersections.

### Standalone Project Measures

These include improvements that could be implemented as part of a dedicated project funding profile (such as widening, new bike lanes, grade separation). Standalone project measures provide opportunities for a variety of improvements within the project area. For example, a roadway urbanization project may also provide an opportunity to construct new active modes connections. All project measures provide an opportunity to integrate and coordinate safety improvements where they are needed within the project area. Standalone Project Measures are presented in Table 3.

**Table 3 - Standalone Project Measures**

Measure	Details
Active Modes Improvements	
New Active Modes Connections	Construction of new connections to extend the existing bike network.

Construct Missing Active Modes Connection	Includes construction of missing connections within the network.
Interchanges and Grade Separations	
Existing Interchange Upgrades/Reconfiguration	Upgrades to existing interchanges, including reconfiguration of individual ramps and/or ramp terminals, widening of bridge structures, or complete reconfiguration of the interchange. Includes exploring Diverging Diamond Interchanges (DDI) as well as Single Point Urban Interchanges (SPUI).
New Interchange	Upgrading of an existing at grade signalized intersection to an interchange, either in a previously planned location or newly recommended location .
Add New Heavy Rail Grade Separation	Construction of railway grade separations based on the operational criteria. The prioritization of grade separations relative to one another should be based on the City's existing prioritization.
Intersection Improvements	
Modern Roundabout	Upgrading of a signalized intersection to a modern roundabout.
Intersection Geometry Improvements-Right Turns	Changes to right turn design to improve traffic flow, primarily focused on the addition of free-flow right turn lanes and associated auxiliary receiving lanes. May also include lengthening of right turn bays to provide more storage, as well as construction of dual right turn lanes to increase capacity.
Intersection Geometry Improvements - Left Turns	Changes to left turn geometry, including construction of dual left turn lanes, consideration for triple left turn lanes, as well as extension of turn bays to provide more storage.
Add New Jughandle Movement	Construction of jug handles to address capacity and congestion concerns. This may include construction of new jug handles, as well as reconfiguration of existing roadways to facilitate jug-handle movements on existing infrastructure.

Transit Improvements	
Add LRT Stations to Existing Lines	Construction of additional LRT stations on existing LRT lines (i.e., Kingsway Mall, Lendrum, 40 Avenue). At locations as identified in the IBI Mass Transit study.
Add New Bus Only Lanes/Shoulders	Roadway widening to provide dedicated bus only lanes or shoulders (painted, and unprotected). At locations as identified in the IBI Transit Priority Measures study.
Road Network Changes	
Add New Road Connection	Construction of greenfield arterial connections, particularly where they facilitate business development.
Remove Road Connection	Removal of existing roadway connections where they induce shortcutting, are redundant, or result in increased congestion in unwanted areas.
Repurposing space (Road Widening or Narrowing)	Addition or removal roadway lanes, including twinning (two to four lanes) and widening (four to six, six to eight lanes, etc), or re-allocating space within the road right-of-way.
Urbanize Road Connection	Upgrading of an existing rural roadway to an urbanized standard with turn bays where no developer commitments exist or where developer commitments have been exhausted.
Add New High Occupancy Vehicle (HOV) Lanes	Roadway widening to provide dedicated new HOV lanes.